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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,797	01/14/2004	Akhil Jiten Madhani	03-DIS-005-PR-US-UTL	5437

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DENVER, CO 80202

EXAMINER

RADA, ALEX P

ART UNIT	PAPER NUMBER
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3714

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/757,797

Applicant(s)

MADHANI ET AL.

Examiner

Alex P. Rada

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 29,30,38 and 52-63 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 59-63 is/are allowed.  
6) ☒ Claim(s) 29,30,38 and 53-58 is/are rejected.  
7) ☒ Claim(s) 52 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

In response to the amendment filed August 28, 2006 in which the applicant cancels claims 1-28, 31-37 and 39-51, amends claims 29-30 and 38, adds new claims 52-63 and claims 29-30, 38 and 52-63 are pending in this application.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 29- are rejected under 35 U.S.C. 102(b) as being anticipated by Osada (US 6,317,652).

Regarding claims 29-30, 38 and 53-58, Osada discloses a legged mobile robot comprising receiving a command from an input device (item 31 of figure 3; where an input device is shown), the command representing a velocity to move the figure (figure 3; where the image control means 35 controls is the velocity to move the figure); translating the velocity into a step length (item 30 of figure 3; where the controller 30 controls the movement of the figure); moving the entire figure at the velocity represented by the received command using the drive mechanism (item 37 of figure 3; where the servomotors are the drive mechanism in each leg of the robot); while the figure is moving, coordinating the leg movement by moving a first leg a distance corresponding to the step length and moving a second leg once the first leg is planted on the ground (item 30 of figure 3 and summary; where the controller 30 receives input from the image data 31 and the states of the of the joints with the encoders 36 associated with the respective joints for thereby recognizing the position of the

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legged mobile robot and actuates servomotors associated with the respective joints for thereby controlling the movement of the legged mobile robot); wherein the act of moving the first leg comprises determining the force when contacting the ground (items 9 and 42; where the six-axis force sensor and the contacted state recognizing means 42 determine the force of contact of the ground); wherein the input device directly controls the velocity (items 31 and 30 of figures 2a-2h and 3; where the robot is walking up a staircase is according to a predetermined walking sequence with a predetermined walking speed and predetermined leg stroke depending on the received input of the image data 31 along with the positional relationship calculating means 34 and the operation modifying means 38, which modifies the walking operation of the legged mobile robot in order to increase the leg stroke when the other foot is to be lifted off or landed on the staircase next); the act of moving the first leg comprises moving the first leg along a partially predetermined trajectory (step 3 of figure 4; where the image input converts an analog image signal from the input device and stores the data into memory then the straight-line component extractor 33 extracts straight-line components present in the image data stored in memory by way of the edge point extraction, which is the moving the leg along a partially predetermined trajectory); where the act of moving the first leg comprises moving the first leg to a predetermined height (figures 2a-2h and figure 4; where the legged robot walks up a staircase the image data is received and the positional relationship calculating means 34 calculates the positional relationship between the staircase and the leg at least one after the leg is lifted off the staircase and until the leg is landed on the staircase); translating the velocity into a step time and completing the act of moving the first leg within the step time (figures 2a-2h and figure 4; where the controller 30 corrects or modifies the subsequent walking operation at short intervals of time for stabilizing the walking operation of the legged mobile robot); stopping vertical motion of the first leg at the conclusion of a step when a preset ground force threshold is

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exceeded (items 9 and 42 of figure 3 and figure 5); and the ground force is sensed indirectly by reading the current command to actuators in the first leg (figures 3, 5 and col. 9, lines 11-53; where the six-axis force sensor 9 serves to detect acting force when the contacted state recognizing means 42 recognizes the direction and position in which the foot is in contact with the edge of the staircase and the controller then recognizes the positional relationship between the staircase and the leg from the direction and the position in which the foot is in contact with the edge of the staircase as recognized by the contacted state recognizing means 42).

***Allowable Subject Matter***

1. Claims 59-63 are allowed.
2. Claim 52 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
3. The following is an examiner's statement of reasons for allowance: The prior art does not disclose nor teach according to claim 59, a method of controlling the movement of a legged figure comprising the legged figure coupled to a wheeled support, the wheeled support being propelled by a drive mechanism; receiving a command from an input device, the command representing a velocity to move the wheeled support; translating the velocity into a step length of the legged figure; moving the wheeled support at the velocity represented by the received command using the drive mechanism and simultaneously moving the legged figure by moving a first leg a distance corresponding to the step length and moving a second leg once the first leg is planted on the ground, the movement of the legged figure being synchronized with the movement of the wheeled support in combination with the rest of the claimed limitations. The closest prior art of Morgrey

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and Osada disclose controlling the movement of a legged figure by receiving command from an input device that represents the velocity to move the legged figure and moving the first leg a specified distance with response to the command input and moving the second leg once the first leg is planted on the ground. Morgrey and Osada both fail to disclose the legged figure coupled to a wheeled support, the wheeled support being propelled by a drive mechanism; receiving a command from an input device, the command representing a velocity to move the wheeled support; moving the wheeled support at the velocity represented by the received command using the drive mechanism and simultaneously moving the legged figure by moving a first leg a distance corresponding to the step length and moving a second leg once the first leg is planted on the ground, the movement of the legged figure being synchronized with the movement of the wheeled support in combination with the rest of the claimed limitations.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

4. Applicant's arguments filed August 28, 2006 have been fully considered but they are not persuasive.

The examiner notes that giving the claims their broadest reasonable interpretation the prior art reference of Osada stills reads on the claimed invention as amended with regards to claims 29-30, 38 and 52-58 as noted above.

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***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex P. Rada whose telephone number is 571-272-4452. The examiner can normally be reached on Monday - Friday, 08:00-16:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Hotaling can be reached on 571-272-4437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
APR

**JOHN M. HOTALING, II**  
**PRIMARY EXAMINER**

